



PATENT APPLICATION  
Do. No. 2522-011

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Yeong-Kwang Kim et al.

Serial No. 09/872,203

Examiner: Julio J. Maldonado

Confirmation No.: 1930

Filed: May 31, 2001

Group Art Unit: 2823

For: METHOD OF FORMING A THING FILM USING ATOMIC LAYER DEPOSITION

Assistant Commissioner for Patents,  
Washington, D.C. 20231

RECEIVED  
JAN 10 2003  
TECHNOLOGY CENTER 2800

Responsive to the Office Action dated October 4, 2002, enclosed is an amendment in the above-identified application.

The fee has been calculated as shown below.

CLAIMS AS AMENDED					
For:	Number After Amendment	Previous Number	Extra	Rate	Additional Fee
Total Claims	42	41	1	x \$18 =	\$18.00
Independent Claims	5	5	0	x \$84 =	\$0
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT					\$18.00

\*greater of twenty (20) or number for which fee has been paid

\*\*greater of three (3) or number for which fee has been paid

- ☒ PTO Form 2038 authorizing credit card payment for the above-listed fees is enclosed.  
☒ Any deficiency or overpayment should be charged or credited to deposit account number 13-1703.

Respectfully submitted,

MARGER JOHNSON & McCOLLOM, P.C.



20575

PATENT TRADEMARK OFFICE

Joseph S. Makuch  
Reg. No. 39,286

MARGER JOHNSON & McCOLLOM, P.C.  
1030 SW Morrison Street  
Portland, OR 97205  
(503) 222-3613

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO:  
☐ COMMISSIONER OF PATENTS AND TRADEMARKS, WASHINGTON D.C. 20231  
☒ ASSISTANT COMMISSIONER FOR PATENTS, WASHINGTON D.C. 20231  
☐ ASSISTANT COMMISSIONER FOR TRADEMARKS, 2900 CRYSTAL DRIVE, ARLINGTON, VA 22202-3513

ON 1-2-03  
*[Signature]*



PATENT APPLICATION

Do. No. 2522-11

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Yeong-Kwang KIM, et al.

Serial No. 09/872,203

Examiner: Maldonado, Julio J

Confirmation No. 1930

Filed: May 31, 2001

Group Art Unit: 2823

For: METHOD OF FORMING A THIN FILM USING ATOMIC LAYER DEPOSITION

Assistant Commissioner for Patents  
Washington, D.C. 20231

RECEIVED  
JAN 10 2003  
TECHNOLOGY CENTER 2800

H-3/A  
1-21-03  
jun.

### RESPONSE TO OFFICE ACTION

Responsive to the Office Action, dated October 4, 2002, please amend the application as follows.

### IN THE SPECIFICATION

Pleaser change the paragraph at page 7, line 26, to page 8, line 2, with the following:

A1  
These steps allow the non-chemically adsorbed portion of the first reactants 40 in the reactor 10 to be diluted in a very short period of time, for example, a few seconds, thus drastically reducing the overall purging time and purging efficiency during a purging step 32 compared to conventional ALD techniques. This dilution process significantly reduces the partial pressure of the non-chemically adsorbed portion of the first reactants 40 in the ALD reactor 10. Thus, only a very small amount of the non-chemically adsorbed portion of the first reactants 40 remain in the reactor 10 after the removal of the non-chemically adsorbed portion of the first reactants 40 as the reactant 40 is already diluted, thus maximizing purging efficiency. Also, because the first reactants 40 are diluted, intermixing between the first reactants 40 can be sufficiently prevented.

### IN THE CLAIMS

1. A method of forming a thin film using atomic layer deposition (ALD), comprising: